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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/228,148	01/11/99	INOUE	Y 970150A

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EXAMINER

EATON, K

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 10/11/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/228,148

Applicant(s)

INOUE ET AL.

Examiner

Kurt M. Eaton

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☒ received in Application No. (Series Code / Serial Number) 08/806,425.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,479.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II (claims 9-18 in Paper No. 10 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 1-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 10.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/806,425, filed on 2/26/97.

Information Disclosure Statement

4. The information disclosure statement filed 7/7/00 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 10, 11, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claims 10, 11, and 18 recite the limitation "said intrusion prevention film..." in lines 2-3 of claim 10, in line 4 of claim 11, and in lines 10-11 of claim 18. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 9-13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leong in view of Wolf et al..

In re claims 9, 10, and 18, applicants' cited Leong shows in Figures 1-3, forming a first insulation film (24) on a conductive layer (20) formed on a substrate (10), wherein the conductive layer includes an aluminum alloy layer and a titanium tungsten layer and wherein the conductive layer is patterned using conventional lithography and etching techniques; introducing impurities into

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the first insulation film by implanting impurities into the first insulation film {column 3, line 35 – column 4, line 25}.

Leong does not show forming a film to substantially prevent the impurities introduced into the first insulation film from entering the conductive layer prior to the step of forming the first insulation film.

Wolf et al. shows, in an analogous art related to lithography, teaches that a titanium tungsten compound can be formed over an aluminum layer and used as an anti-reflective layer in conventional lithography processes {vol. 1; page 441}.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the titanium tungsten layer mentioned to be included in the conductive layer of Leong over the aluminum alloy layer mentioned to be included in the conductive layer of Leong as suggested by Wolf et al. since, as evidenced by Wolf et al., titanium tungsten material is a well known material that could aid in the lithography process employed by Leong. It is also a well known fact that titanium tungsten material is a diffusion barrier material that would also prevent the composition of the underlying conductive material from being altered due to any chemical reaction from subsequently applied processes.

In re claim 11, Leong further includes the step of forming a second insulation film (22) on the conductive layer and the intrusion prevention film prior to the step forming the first insulation film {column 3, lines 49-53}.

In re claim 12, Leong teaches the second insulation includes a film less hygroscopic than the first insulation film.

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In re claim 13, Leong further includes the step of forming a third insulation film (26) on the first insulation after the step of implanting impurities into the first insulation film {column 4, lines 1-25}.

In re claim 15, Leong shows wherein the first insulation film includes an inorganic SOG film {column 6, lines 45-50}.

In re claim 16, Leong shows wherein the step of introducing is carried out by ion implantation {column 4, lines 1-5}.

In re claim 17, Leong shows wherein the impurities include at least one element selected from the group of argon, boron, nitrogen, and phosphorous {column 4, lines 1-20}.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leong in view of Wolf et al. as applied to claim 9 above, and further in view of Wolf.

Leong shows wherein the first insulation film is an SOG film which includes silicon oxide {column 3, line 49 – column 4, line 20}.

Leong in view of Wolf et al. fails to show wherein the first insulation film includes silicon oxide containing at least 1% of carbon.

Wolf teaches, in an analogous art related to multilevel interconnect technology that SOG films that include silicon oxide should contain at least 1% carbon to improve cracking resistance {vol. 2, pages 232-3}.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the first insulation film of Leong in view of Wolf et al. such that it contained at least 1% of carbon since, as suggested by Wolf, SOG films that include silicon oxide and that contain at least 1% carbon have improved resistance to cracking.

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Conclusion

12. Paper related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is (703) 308-7722 or -7724. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication of earlier communication from the examiner should be directed to **Kurt Eaton** at (703) 305-0383 and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via kurt.eaton@uspto.gov.



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